STANDPOINT

From

Assoc. Prof. Dr. Todor Penchev Shamov MD
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About
Defense of the dissertation of
Dr. Martin Nikolaev Moynov

On the topic:
"Neuronavigated needle biopsy in cranial neurosurgery"

Presented for the award of
Educational and scientific degree "Doctor"
In the scientific specialty "Neurosurgery"

Brief biographical data:

Dr. Martin Moynov was born in 1985 in the town of Veliko Tarnovo. In in 2004 he graduated from the 4th Language school in Varna studying French and English. In 2012 he graduated in medicine at the Medical University in Varna, and then specialized in neurosurgery at the Clinics of Neurosurgery at the hospital "St. George"- Plovdiv and" St. Marina"- Varna. Since 2017 he works as an assistant at the Department of ENT and Neurosurgery, MU-Varna. Since 2018 he is a doctoral student at MU-Varna. In 2019 he was recognized as specialist in neurosurgery. During his periods as a medical student and resident in neurosurgery he has long-term and short-term specializations, courses, congresses and symposiums in a number of leading medical and in particular neurosurgical centers in Bulgaria, France, Hungary, Switzerland, Romania, Ghana, Palestine. Dr. Moynov has been a member of the Bulgarian Society of Neurosurgery since 2013, and a member of the international AOSpine society since 2017.

Relevance of the topic:

Histological diagnosis is a leading factor in modern oncological treatment of lesions in the brain. To date, framework stereotaxy has been at the forefront of minimally invasive biopsy interventions for intracranial lesions. The rapid pace of technological development and the timely introduction of computer-based technologies in medicine allowed the application of image-based neuronavigation systems in oncological neurosurgery for minimally invasive histological verification. The published data on efficacy, safety and diagnostic value are encouraging but limited, and the lack of standards significantly complicates the objective comparative analysis of the various operational results.

In this regard, I believe that the topic of the dissertation is relevant and significant.

Structure of the dissertation:

The dissertation on "Neuronavigated needle biopsy in cranial neurosurgery" has a volume of 173 standard typewritten pages. Its structure fully meets all accepted requirements. It consists of Introduction and Literary Review - 38 pages, Purpose and tasks - 1 page, Materials and methods - 26 pages, Results - 57 pages, Discussion - 26 pages, Conclusion and conclusions - 2 pages, Contributions - 1 page, Bibliography - 15 pages. The presented material is illustrated with 135 figures and 71 tables. Dr. Moynov used 260 literary sources.

Literature review:

The literature review related to the topic is detailed and thorough, using all the cited titles. The principles of neuronavigation, the problem of brain displacement, as well as the application of neuronavigation in onconeurosurgery are discussed in detail, as the author has clearly presented the basic biopsy tools, in order to illustrate the possible

differences in surgical technique not only on the part of the used neuronavigation system, but also on the instruments used by the operator.

The introduction and literature review presented in the doctoral dissertation bring out unsolved problems and formulate the set goal of the research.

Purpose and tasks:

The purpose has been clearly defined: optimization of the minimally invasive neuronavigated technique for diagnosis and treatment and introduction of a surgical algorithm based on analysis and summary of the experience gained with neuronavigated needle biopsy in patients with supratentorial intraaxial lesions. The goal set by the doctoral student is achieved by solving seven precisely and clearly formulated tasks.

Materials and methods:

The study includes a total of 40 patients operated under general anesthesia with supratentorial intraaxial lesions in the Clinic of Neurosurgery of the University Hospital - "St. Marina" Varna for the period January 2019 - December 2021, during which a neuronavigated needle biopsy is performed intraoperatively.

The used literature is described and the used intraoperative technique is explained in detail. The methods of creating and implementing the protocol for intraoperative neuronavigated needle biopsy are clearly laid out as well. The descriptive and analytical statistical methods used by the author are clearly presented.

Results:

The results are presented in 57 pages and are illustrated with tables and figures. The patients were divided into two groups - 15 patients with isolated neuronavigated needle biopsy and 25 patients with biopsy and excision of the histologically verified formation. Given the retrospective nature of the analysis and the need for detailed presentation of information about the representative sample of patients, the doctoral student arranged and presented the data in tables and figures, demonstrating and commenting on all statistically significant differences in the selected groups of patients.

Indications and contraindications for navigating needle biopsy are discussed. Retrospective analysis is performed on the operative time, size of lesions and the number of biopsy materials taken. Correlation dependence test including used imaging studies and postoperative complications is performed. Factors influencing diagnostic production like age, sequences from intraoperative MRI scans and anamnestic data for previous radiotherapy, previous surgery and previous biopsy are analyzed.

Discussion:

A critical and analytical discussion of the results is conducted in the context of current literature sources for biopsied patients with intraaxial lesions. The imaging studies used for intraoperative navigation, the technical aspects of neuronavigated biopsy in connection with biopsy instruments, the technique of aspiration, factors influencing diagnostic production, the technique of obtaining valuable intraoperative biopsy material and intraoperative and postoperative measures are discussed.

The individual approach related to the choice of the operator in relation to the degree of radicalism of the conducted intervention is discussed.

Conclusions:

Based on the results and their discussion, Dr. Moynov formulated conclusions presenting neuronavigated needle biopsy, under general anesthesia, in patients over 18 years with supratentorial intraaxial lesions, as an intervention with excellent results, high diagnostic output. The technique increases the surgeon's confidence in taking a decision on the need for radical surgery, while remaining an efficient, safe intervention of high diagnostic value, with the possibility of application in routine neurosurgical practice.

Publications:

The doctoral student has four scientific publications in connection with the dissertation. Of these, two full-text articles have been published in journals. Two scientific papers have been presented at conferences and published in joint compendiums. The doctoral student's publications bring him enough credit in relation to the standard requirements for scientometric indicators for the award of the Educational and Scientific Degree "Doctor" in the surgical specialty - Neurosurgery.

Conclusion:

The presented dissertation is the result of a large amount of research material and solves problems related to the application of neuronavigation technologies, their

optimization and efficiency, aimed directly at application in practice related to minimally invasive histological verification.

In terms of significance, topicality and originality, the work has all the qualities of a dissertation for obtaining an educational and scientific degree "Doctor". The dissertation contains scientific and applied research results that represent an original contribution to science and meet all the requirements of the Academic Staff Development Act in the Republic of Bulgaria, the Regulations for the implementation of the Academic Staff Development Act in the Republic of Bulgaria and the Regulations of MU-Varna. The presented materials and dissertation results fully comply with the specific requirements adopted in connection with the Regulations of MU-Varna for application of the Academic Staff Development Act in the Republic of Bulgaria.

Based on the presented dissertation and the fulfilled criteria determined by the Law for development of the academic staff, the Regulations to it and those to MU-Varna, I give a positive vote to the presented work and propose to the honorable jury to award educational and scientific degree "Doctor" of Dr. Martin Nikolaev Moynov in the scientific specialty Neurosurgery.

3.6.2022
Sofia

Assoc. Prof. Dr. Todor Penchev Shamov MD
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